DOCUMENT RESUME

ED 025 322 PS 001 483

By- Manning, Brad A.; And Others

Cooperative, Trusting Behavior as a Function of Ethnic Group Similarity-Dissimilarity and of Immediate and Delayed Reward in a Two-Person Game. Part of the Final Report.

Texas Univ., Austin. Child Development Evaluation and Research Center.
Spons Agency- Office of Economic Opportunity, Washington, D.C.
Report No- OEO-4115
Pub Date Aug 68
Note- 40p.
EDRS Price MF-$0.25 HC-$2.10
Descriptors- Anglo Americans, *Behavior Patterns, *Ethnic Groups, *Group Activities, Heterogeneous Grouping, Homogeneous Grouping, Kindergarten Children, Mexican Americans, Negroes, *Peer Groups, Rewards
Identifiers- Competitive Behavior, Cooperative Behavior, *Head Start

One hundred and thirty-six 5- and 6-year-olds participated in this study, which investigated the extent to which cooperative, trusting behavior could be demonstrated between Mexican-American, Negro, and Anglo-American children. Also considered were some of the basic variables which were important in the development of such behavior. Similar and dissimilar ethnic-group pairs were placed into immediate or delayed reward groups. Each child was given a choice of either competitive or cooperative behavior in relation to an unseen partner's behavior. Male subjects showed no significant differences in behavior. Female similar ethnic pairs were more cooperative than were dissimilar ethnic pairs, with the exception of Mexican-American and Negro pairs. Anglo-American females competed the most. Type of reinforcement and number of trials did not affect cooperative behavior. Greater maturity and understanding of ethnic mores might have been responsible for female behavioral differences. A bibliography is included. (MS)

U. S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

deep checks

ED025322

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

PART OF THE FINAL REPORT

to

THE OFFICE OF ECONOMIC OPPORTUNITY

(Contract No. OEO-4115)

CHILD DEVELOPMENT EVALUATION AND RESEARCH CENTER

John Pierce-Jones, Ph.D., Director

The University of Texas at Austin

August, 1968

COOPERATIVE, TRUSTING BEHAVIOR AS A FUNCTION OF ETHNIC GROUP SIMILARITY-DISSIMILARITY AND OF IMMEDIATE AND DELAYED REWARD IN A TWO-PERSON GAME

by

Brad A. Manning
John Pierce-Jones
Rhona L. Parelman

PS001483

ED025322

PART OF THE FINAL REPORT

to

THE OFFICE OF ECONOMIC OPPORTUNITY

(Contract No. OEO-4115)

CHILD DEVELOPMENT EVALUATION AND RESEARCH CENTER

John Pierce-Jones, Ph.D., Director

The University of Texas at Austin

August, 1968

COOPERATIVE, TRUSTING BEHAVIOR AS A FUNCTION OF ETHNIC GROUP SIMILARITY-DISSIMILARITY AND OF IMMEDIATE AND DELAYED REWARD IN A TWO-PERSON GAME

by

Brad A. Manning
John Pierce-Jones
Rhona L. Parelman

COOPERATIVE, TRUSTING BEHAVIOR AS A FUNCTION OF ETHNIC GROUP SIMILARITY-DISSIMILARITY AND OF IMMEDIATE AND DELAYED REWARD IN A TWO-PERSON GAME

Brad A. Manning
John Pierce-Jones
Rhona L. Parelman

The University of Texas at Austin

Austin, Texas

Abstract

One hundred and forty-four Mexican-American, Negro, and Anglo-American, five- and six-year-old "Head Start" children (72 males and 72 females) took part in a 2-person, 2-choice game. They could choose to cooperate or compete with another child on a total of 30 trials. The subjects were divided into groups consisting of similar and dissimilar ethnic-group pairs. The groups of similar and dissimilar ethnic-group pairs were in turn divided into immediate and delayed reward groups. Males and females were divided equally between all combinations of ethnic-group pairing and type of reinforcement. Three 2×6×6 analysis of variance designs were used to analyze

2 types of reward, 6 ethnic pairings, and 6 blocks of 5 trials. The sexes were first analyzed together and then separately.

It was found that, for females, similar ethnic pairs cooperated significantly more ($p<.05$) than dissimilar ethnic pairs, with the exception of Mexican-American:Negro pairs who maintained a high level of cooperation. Three 3X3X2 analysis of variance designs were used to analyze 3 ethnic groups, 3 types of ethnic pairs (1 similar and 2 dissimilar) and 2 types of reinforcement. In this design the sexes were also analyzed, combined and then separated. It was found for females that the 3 ethnic groups differed significantly ($p<.01$) in their amount of cooperative behavior, with Anglo-Americans competing the most. Cooperative behavior was not differentially affected by the type of reinforcement used, nor did it increase as a function of trials.

COOPERATIVE, TRUSTING BEHAVIOR AS A FUNCTION OF ETHNIC GROUP SIMILARITY-DISSIMILARITY AND OF IMMEDIATE AND DELAYED REWARD IN A TWO-PERSON GAME

Brad A. Manning
John Pierce-Jones
Rhona L. Parelman

The University of Texas at Austin

Austin, Texas

One of the basic developmental tasks in the socialization process is the development of cooperative behavior. Whether or not the child has learned to trust others is crucial to the occurrence of cooperative behavior. The culturally deprived child's environment has been described by Riessman (1963) as encouraging cooperative behavior within an extended family. On the other hand, the child's association with groups other than the extended family may be rather limited. Thus, there may be few opportunities to engage in trusting, cooperative behavior with "outside" groups. Difficulties often arise when the culturally deprived child is required to interact with diverse groups of differing ethnic background in the school setting.

It would seem that the child could greatly benefit from the opportunity to associate with members of such diverse groups under conditions in which he was rewarded for trusting behavior and encouraged to freely interact in a cooperative manner. Further, if it is granted that the development of trusting, cooperative behavior with many different types of people is important to the culturally deprived child's adaptation both to the school and to the environment at large, it would seem most necessary to examine both the degree to which trusting, cooperative behavior exists among groups within the broad class of children designated as "culturally deprived" and some of the basic conditions under which it may be developed.

The problem then arises of determining how cooperative, trusting behavior may be studied in the child. Maier (1965), in summarizing Erikson's theory of child development, pointed out that Erickson's theory place a strong emphasis upon the fact that the play of children may be considered as a form of self-expression of the ego. Through play, the child experiments with his environment and practices new behaviors in an attempt to organize his relationship to the environment. Given the importance of play both for the child and for the adult seeking to

understand the child, it would seem ideal to incorporate play in the study of cooperative, trusting behavior.

One way of studying cooperative behavior and also competitive behavior in a well-controlled laboratory setting which would also incorporate a situation in which the children could play, is that of a game. Such a game should have definite criteria of "cooperative" and "competitive" action known to the players, as well as means of identifying players' attempts to maximize joint, as opposed to individual, gain.

There is a rapidly growing body of literature on experiments which utilize games and which make it possible to thereby study cooperative and competitive behavior. Rapaport (1959) outlined the rationale for such an approach:

> Game theory is an attempt to bring within the fold of rigorous deductive method those aspects of human behavior in which conflict and cooperation are conducted in the context of choices among alternatives whose range of outcomes are known to the fullest extent to the participants. (Rapaport, 1959, p. 65)

Gallo (1965), in defense of using the type of game described above, stressed the importance of supplying a well controlled, small group interaction situation with easily quantifiable data. For example, the number of cooperative

responses is but one of the many possibilities of organizing game experimental data in a quantifiable fashion. Games of this type also provide an excellent opportunity to study the individual's perceptions, motivation, personality structure, attitudes, and, of course, how he learns to cooperate or compete with others.

Gallo (1965) defines a game as, "a situation in which the persons involved are attempting to attain some goals and in which their success or failure is dependent not only upon their strategy choices but also upon the strategy choice of the other individual(s) in the situation" (Gallo, 1965, p. 68). Thus, one theoretical basis for the use of the game approach is that it is able to focus directly upon cooperative and competitive behavior in a situation in which the individual must explicitly choose to cooperate or compete on the basis of some factors relating to the other player, as well as to his own orientation.

In this study, the two major concerns were with the extent to which cooperative, trusting behavior could be demonstrated between the children of the broad class designated as "culturally deprived" and some of the basic variables which were important in its development. These

concerns lent themselves readily to the game approach described above. An added advantage of this type of game was the fact that the experimenter could control the information perceived as the "outcome of the other player's choices" without letting the players become aware of such intervention. Hence, in a two-person game, player A would make his choice in the game, which would be recorded by the experimenter; but the information that player B received about player A's choice might or might not represent player A's actual choice. With such control it was then possible to set up a schedule of reinforcement in order to optimally develop the desired type of behavior--i.e., cooperative, trusting behavior.

Using a two-person game, Vello (1967), simulated a "tit-for-tat" strategy with a beginning-game unconditional cooperative response for each subject and found that this type of treatment produced a high level of cooperative behavior. In other words, each player believed that he was playing with an individual who made a cooperative response regardless of anything that happened in the first part of the game but, for the rest of the game, cooperated only when his partner in the game cooperated. The description of a game of this type will be presented in the method section.

PS001483

The usual ethnic groups represented among the culturally deprived of the Southwest are the Mexican-American, Anglo-American, and Negro. These three groups undoubtedly differ in the degree to which they would engage in cooperative, trusting behavior both in their interaction within their own respective ethnic groups and in their interaction with the other groups. It was expected that all groups would increase their cooperation as a function of trials. It was also expected that the Mexican-American group would engage in more within-group cooperation (i.e., two Mexican-American children taking part in a game together as opposed to a Mexican-American child taking part in the game with a Negro or Anglo-American child) than would Negroes and Anglo-Americans. This was based on the fact that the Mexican-American values emphasize a feeling of oneness within the group in the concept of "La Raza," or the "race" (Madsen, 1964). To the degree that the Negro culture has developed or is presently developing this type of feeling, a great deal of within-group cooperation was expected. The Anglo-American group was expected to show the least within-group cooperation of the three groups, since it was probable that there would be some identification with the competitive majority-group

culture. On the other hand, it was expected that Anglo-Americans would cooperate more with members of their own group than with the other groups, as will be clarified below.

To the extent that different ethnic groups have different attitudes, the literature concerned with the effects of attitude on social interaction was relevant in terms of predicting relative difference in the amount of trusting, cooperative behavior that would occur between ethnically similar and dissimilar pairs in the general type of game described above. It has been shown that: college students will assume a greater similarity of attitudes between themselves and their classmates, as compared with other classes, than is actually the case (Newcomb, 1943); that individuals who associated social class with way of life (and therefore, presumably with attitudes) tended to be attracted to people of their own class (Hamman, 1952); that interpersonal attraction is a function of shared opinions about common associates as well as important and relevant objects (Newcomb, 1965); that interpersonal attraction is related to the degree to which one projects one's own values upon another person (Smith, 1957); that affiliation need and attitude similarity are related

to interpersonal attraction (Byrne, 1961); that husbands and wives not only possess similar attitudes but also perceive them to be more similar than is the case in actuality (Byrne, et al., 1963); that similarity-dissimilarity of attitudes influences the degree of attraction that white students feel towards Negroes (Byrne, et al., 1964); and that attitude statements can act as positive and negative reinforcements in a learning task (Golightly, et al., 1964).

In inspecting some of the above results, certain trends were discovered. Interpersonal attraction seemed indeed to be a function of attitude similarity-dissimilarity. Similar attitudes resulted in positive attraction and dissimilar attitudes in negative attraction. Individuals tended to assume beyond the actual evidence that other individuals whom they liked held attitudes about important and relevant matters which were similar to their own. Such relationships might be extended in a number of directions. For example, to the relationship shown between similar attitudes and positive attraction, we might add a third term such that similar attitudes result in positive attraction, which in turn would result in trusting, cooperative behavior. Guetzkow (1967), writing in the context

of international problems, has hypothesized that similar cultures (defined as those sharing many of the same values and hence accepting each other) would be more prone to form collaborative policies (trusting, cooperative behavior) than would cultures which are dissimilar. From the material discussed in the above few paragraphs, it would seem likely that ethnic groups share a number of attitudes among themselves which they do not share with members of other ethnic groups, and that this would produce more within-group cooperation and trust than between-group cooperation and trust.

Both the type of incentive and the way in which incentive was given in the game were of crucial importance. Since the subjects were essentially learning to cooperate under conditions of experimentally aroused and naturally occurring distrust, it was important that the incentive be both meaningful and effectively given. Davis (1941, 1943) has pointed out that the lower class child is too preoccupied with survival from one day to the next to value anything other than material rewards. Dovan (1956) found that lower class subjects did not perform successfully on a series of tasks when material reward was not given. Terrell and Kennedy (1957) and Terrell, Durkin

and Wiesley (1959) found similar results for lower class children using such material incentives as candy. In general, candy seemed to be the most appropriate incentive for this type of population.

Whether or not reward is given immediately is also an important variable for a culturally deprived population. The effects of immediate and delayed reward were studied separately by giving one half of the group its candy immediately after each choice in the game and the other half of the group a symbolic substitute for a reward which could be exchanged at a later time for a piece of candy. Lashan (1952) pointed out that lower class parents tended to train their children with immediate rewards and punishments. Gordon (1956) stated that both postponement of gratification and symbolic rewards do not positively affect the motivational system of the lower class child. The lower class child's goals are more immediate and utilitarian.

Thus, from the discussion above, several hypotheses were made. From the studies concerned with the effects of attitudes on social interactions, the first hypothesis was that: similar ethnic-group players in a two-person game (i.e., Mexican-American:Mexican-American;

Negro:Negro; Anglo-American:Anglo-American) would engage in more cooperative, trusting behavior than would dissimilar ethnic-group players (i.e., Mexican-American:Negro; Mexican-American:Anglo-American; Negro:Anglo-American). From the above materials concerned with the effects of immediate and delayed reward, the second hypothesis was that: groups given immediate reward in the form of candy would engage in more trusting, cooperative behavior than would groups given delayed reward in the form of a symbolic substitute which could be exchanged for candy. A third hypothesis was that all groups would learn to engage in cooperative, trusting behavior as a function of trials.

Method

Subjects

The subjects consisted of 144 children from a culturally deprived population representing typical "Head Start" five- and six-year-old children. This total group was divided into 72 males and 72 females. The males and females were assigned equally to six groups of similar and dissimilar ethnic combinations. These six groups were in turn split into two groups each, one receiving immediate

reward and the other receiving delayed reward. Thus, there was a total of twelve groups consisting of 12 subjects each.

Experimental Conditions

Two major treatment effects were manipulated. The effect of similar and dissimilar ethnic-group partners was one major treatment effect. The second was that of immediate and delayed reward. The sex variable was controlled for in that half of each of the twelve groups listed above consisted of each sex. The groups that were run were then as follows: (1) Mexican-American:Anglo-American:immediate reward; (2) Mexican-American:Anglo-American:delayed reward; (3) Mexican-American:Negro:immediate reward; (4) Mexican-American:Negro:delayed reward; (5) Negro:Anglo-American:immediate reward; (6) Negro: Anglo-American:delayed reward; (7) Mexican-American:Mexican-American:immediate reward; (8) Mexican-American:Mexican-American:delayed reward; (9) Negro:Negro:immediate reward; (10) Negro:Negro:delayed reward; (11) Anglo-American: Anglo-American:immediate reward; (12) Anglo-American: Anglo-American:delayed reward.

Uniform Events of the Experiment for all Groups

All subjects were brought into the experimental room two at a time for an experiment that took 45 minutes. They were first seated side by side in front of one of the game boards (described below). At this time, they were informed by a female experimenter that they would have an opportunity to take part in a game with each other in which they would have a chance to win some candy. The experimenter then proceeded to explain the game to the subjects. In brief, they were told that they would have two choices on each of the many turns that they would get to take in the game. One subject would make his choice while the other one waited. The two choices were: (1) the subject could decide to pull a lever that would give him one piece of candy and the other subject one piece of candy (i.e., trusting, cooperative behavior), or (2) the subject could decide to pull another lever that would result in his receiving one piece of candy and the other subject not receiving any (nontrusting, competitive response). It was made clear to the children that they could keep the other subject from winning as much candy as they did on any given trial, but that the other subject

might do the same thing to him on the next trial, when it was the other subject's turn to choose. The subjects were then told that under no circumstances would they be allowed to talk or ask questions during the game. They were then questioned in detail to make sure that they understood the game and the restriction of not talking during the game.

There were 30 trials in the game, where a trial was defined as a sequence in which each subject took one turn. All the information received by the subjects about the other subject's choices was entirely controlled by a second experimenter. The subjects were each rewarded for cooperation and given no reward for noncooperation, except for the first 5 trials, where both cooperation and noncooperation were rewarded in order to maximize cooperation, as was done by Vello (1967). This "tit-for-tat" reward administration was done in such a manner that non-reward appeared to be retaliation on the part of the other subject. This was done, first, by giving the appropriate reward to the subject after he made his choice, but making the reward following the "other subject's choice" contingent upon his own cooperation on the previous trial. For example, if subject A chose to give and receive one piece

of candy (cooperative response), he was given one piece of candy after he made his choice and another piece of candy after subject B made his choice, regardless of what subject B chose. If subject A had chosen to compete, the above sequence of events would have been the same, except that subject A would have received no candy after subject B's choice. The details of reward administration are discussed below.

In order to insure that the subjects understood the game, the difference between their two choices, and the implications of their choices, the female experimenter spent at least one-third of the 45-minute experimental period coaching the subjects. After the first 5 trials of the game the subjects were questioned again in order to insure that they understood the difference between their two choices. The game was then continued for 25 more trials. At the end of the game the subjects were again questioned about their understanding of the game. Those subjects who did not completely understand what their two choices were and what these involved were not included in the study (8 children in this category).

Apparatus

The subjects participated on a portable apparatus which could be set up in any small room. The apparatus consisted of two subject game boards and two experimenter miniboxes. The subjects were seated at opposite ends of a table, one on each side of the experimenters, and separated from them by partitions. The two experimenters sat across the table from each other. One experimenter called out the subjects' names when it was their turn and recorded their responses. The other experimenter administered the rewards. Each subject's game board contained two levers which, when pulled, both activated a bell (in order to make the experiment more realistic and communicate to the subject that he had done something to the environment by pulling the lever) and turned on a light on the experimenter's panel, informing the experimenter of the subject's choice. The levers on the subjects' panels represented the two choices possible in the game. Pulling one lever indicated that the subject had chosen to get one piece of candy for himself and let the other subject also get one piece of candy (cooperative response). Pulling the other lever represented the subject's desire to get one piece of candy while denying the other subject any candy

(competitive response). The experimenter's miniboxes (one for each subject) each contained two lights which informed the experimenter of any one subject's choice for a given trial.

The panels that separated the two subjects from the experimenter each contained a small hole so that the experimenter could quietly present the reward to each subject through an inclined aluminum tube. Recorded music was used as a masking noise to drown out the noise of the reward being given and to avoid having the subjects suspect that the other subject was being rewarded at any time other than when his "partner" in the game chose to cooperate with him.

The subjects in the immediate reward condition received pieces of "M & M" candies in aluminum trays which were padded with cloth in order to further decrease the noise of reward administration. The subjects in the delayed reward condition received vinyl pellets (about the size of a dried pea) which accumulated in a plexiglass-faced minibox attached to each game board. When the game was over the miniboxes were removed from the game board and the subjects were given one "M & M" candy for each vinyl pellet that they had received.

Results

The dependent variable used in this study was the number of cooperative responses made by each subject. The first data analysis used was a 2×6×6 analysis of variance with both between and within dimensions. The between dimensions were the two levels of reinforcement (immediate and delayed), and six levels of ethnic-group pairing (Mexican-American:Mexican-American; Negro:Negro; Anglo-American:Anglo-American; Mexican-American:Anglo; Mexican-American:Negro; and Anglo-American:Negro). The within dimensions were 6 blocks of 5 trials. Hence, there were six repeated measures of the total number of cooperative responses made in each block of 5 trials for each subject. As listed in the method section of this paper, there were a total of twelve groups (the six ethnic-group pairings receiving either immediate or delayed reinforcement). As can be seen from Table 1, neither the main effects nor the interaction effects reached an appropriate level of significance. The following conclusions can then be made for males and females as a combined group: that similar ethnic-group pairs did not engage in significantly more cooperative, trusting behavior than did dissimilar ethnic-group pairs; that immediate reward did not produce

Table 1

Analysis of Variance for Males and Females Combined

Source	df	MS	F
Between	143	10.68	
Type of Reinforcement (A)	1	13.75	1.30
Type of Ethnic pair (B)	5	14.68	1.39
A X B	5	8.45	.80
Error Between	132	10.58	
Within	720	.59	
Blocks of 5 trials (C)	5	.77	1.26
A X C	5	.22	.35
B X C	25	.47	.77
A X B X C	25	.32	.56
Error Within	660	.61	
Total	863	2.261	

significantly more cooperative behavior than did delayed reward; and that cooperative, trusting behavior did not increase as a function of trials.

It was thought that there might have been a differential response for males and females considered separately. Males and females were then analyzed separately with the same 2×6×6 analysis of variance. As Table 2 indicates, the 2×6×6 analysis of variance for males yielded the same general results as the analysis for males and females combined. There were no main effects or interaction effects that reached an appropriate level of significance. The conclusions for the males alone in this analysis would be the same as for males and females combined.

When a 2×6×6 analysis of variance was made on the group of females (see Table 3) it was found that there was a significant ($p<.05$) "type of ethnic pair" treatment effect. This significant treatment effect means, generally, that the combination of ethnic groups in each pair of subjects made a difference in the amount of cooperative, trusting behavior engaged in by females. The Mexican-American:Mexican-American pairs had a group mean (4.15) which was identical to the Anglo-American:Anglo-American group mean (4.15). The Negro:Negro group mean was 3.49.

Table 2

Analysis of Variance for Males

Source	df	MS	F
Between	71	9.34	
Type of Reinforcement (A)	1	24.08	2.44
Type of Ethnic pair (B)	5	2.09	.21
A X B	5	7.21	.74
Error Between	60	9.88	
Within	360	.56	
Blocks of 5 trials (C)	5	.73	1.26
A X C	5	.81	1.39
B X C	25	.41	.70
A X B X C	25	.41	.71
Error Within	300	.58	
Total	431	2.01	

Table 3

Analysis of Variance for Females

Source	df	MS	F
Between	71	12.13	
Type of Reinforcement (A)	1	.11	.01
Type of Ethnic pair (B)	5	26.68	2.38*
A X B	5	9.76	.86
Error Between	60	11.32	
Within	360	.62	
Blocks of 5 trials (C)	5	1.00	1.58
A X C	5	.78	1.23
B X C	25	.59	.94
A X B X C	25	.39	.61
Error Within	300	.63	
Total	431	2.51	

*$p < .05$

The Mexican-American:Anglo-American group mean was 2.85; the Anglo-American:Negro group mean was 2.92; and the Mexican-American:Negro group mean was 4.04. With the exception of the Mexican-American:Negro pairs, who had a relatively high group mean, the dissimilar groups had lower mean scores of cooperative responses per block of 5 trials than did the similar groups. These findings for the females support the first hypothesis of this study that similar ethnic-group pairs will engage in more cooperative, trusting behavior than will dissimilar ethnic-group pairs. The other main effects and the interaction effects for this analysis for the female group did not reach an appropriate level of significance. In other words, the type of reinforcement and the number of trials completed in the game had no effect on the level of cooperative, trusting behavior.

From a general inspection of the data, it was thought that the three ethnic groups under consideration might differ in their tendency to engage in cooperative, trusting behavior, regardless of the ethnicity of the other player. In order to answer this question, a 3×3×2 analysis of variance was first made on the total number of coopertive responses made by each subject. There were three levels

of ethnicity (Mexican-American, Negro, and Anglo-American), three levels of ethnic pairing (one level was similar ethnic-group pairing, and the remaining two levels were dissimilar ethnic-group pairing, for example, Mexican-American:Mexican-American, Mexican-American:Anglo-American; Mexican-American:Negro). Finally, there were two levels of type of reinforcement.

The first 3×3×2 analysis was made on males and females combined. As Table 4 indicates, the ethnic-group classification was significant at the .05 probability level. In general, this indicates that the ethnic groups differed significantly in the degree to which they engaged in trusting, cooperative behavior. Specifically, the Negro group had the highest mean number of cooperative responses (23.44), the Mexican-American the next highest (22.07) and the Anglo-American group the lowest (19.22). All other main effects and interaction effects failed to reach an appropriate level of significance.

This same 3×3×2 analysis of variance was then made on the female subjects separately. Again, there was a significant main effect ($p<.01$) for ethnic-group classification. But in the case of the females, the Mexican-American group mean was the highest (24.03), the next

Table 4

Analysis of Variance for Males and Females Combined

Source	df	MS	F
Between	17	73.72	
Ethnic Group Classification (A)	2	200.34	3.15*
Type of Ethnic pair (B)	2	71.97	1.13
Type of Reinforcement (C)	1	52.14	.82
A X B	4	87.18	1.37
A X C	2	17.29	.27
B X C	2	16.34	.26
A X B X C	4	60.11	.95
Within	126	63.52	
Total	143	64.73	

*p .05

highest was the Negro group (22.19) and, again, the lowest group was the Anglo-American, with a mean score of 16.58. As was true of the 3X3X2 analysis when it was made on both sexes combined, there were no other main effects and no interaction effects for females (see Table 5). The point to note here is that, for both males and females combined and for females alone, the Anglo-American group was the least cooperative, while the Mexican-American and Negro groups were close in their degree of cooperative behavior.

Finally, a 3X3X2 analysis of variance was made on the male subjects alone. There were no main effects or interaction effects which reached an appropriate level of significance. Apparently, the ethnic-group membership effect found in the combined male and female analysis was due to the behavior of the females.

Discussion

There were several findings that stood out in this study. The most conspicuous aspect of the findings lay in the fact that the only statistically significant main effects found did not appear until after the females were separated from the rest of the subjects and analyzed

Table 5

Analysis of Variance for Females

Source	df	MS	F
Between	17	111.51	
Ethnic Group Classification (A)	2	324.96	5.16**
Type of Ethnic pair (B)	2	114.21	1.81
Type of Reinforcement (C)	1	2.01	.03
A X B	4	149.59	2.38
A X C	2	16.29	.26
B X C	2	11.21	.18
A X B X C	4	90.49	1.44
Within	54	62.94	
Total	71	74.57	

**p .01

Table 6

Analysis of Variance for Males

Source	df	MS	F
Between	17	47.25	
Ethnic Group Classification (A)	2	115.55	1.99
Type of Ethnic pair (B)	2	60.80	1.05
Type of Reinforcement (C)	1	77.36	1.33
A X B	4	39.25	.68
A X C	2	48.11	.83
B X C	2	28.29	.49
A X B X C	4	15.84	.27
Within	54	57.96	
Total	71	55.40	

alone. The one exception to this was in the case where the females were contributing the variance in a combined group.

In the first type of analysis used, it was found that, for females, similar ethnic-group pairs cooperated significantly more than did dissimilar ethnic-group pairs, with the exception of the Mexican-American:Negro combination, which cooperated considerably. There are two questions that need to be raised at this point. Why did a dissimilar ethnic combination like Mexican-American:Negro cooperate more than the other dissimilar groups? Why did females respond, in general, in the manner predicted in the first hypothesis of this study, while the males did not?

In answer to the first question, it should be pointed out that the Negroes and Mexican-Americans of the Southwest frequently live in the same communities, and thus share many aspects of life. This would be especially relevant for children who are used to playing only with the other children in their own neighborhoods. Hence, there would be less perceived dissimilarity between a Mexican-American and a Negro than there would be between either a Mexican-American or Negro and an Anglo-American.

Even among the lower classes, the Anglo-Americans live apart from their Mexican-American and Negro counterparts. In addition, since both Mexican-Americans and Negroes are members of minority groups in this culture, they might be expected to perceive each other as sharing attitudes relating to this status.

The answer to the second question is less clear. One possible reason why females responded more cooperatively when confronted with a similar ethnic-group partner than with a dissimilar partner, while boys responded with an equal degree of cooperation for both ethnically similar and dissimilar partners, would lie in the females' greater maturity at ages five and six. Because of this greater maturity, the female has acquired many of the attitudes of the community (including its racial prejudices) from which she comes, while the males' attitudes on many things have not yet crystallized to this extent.

The results of the second type of analysis used in this study (the 3×3×2 analysis of variance) indicated that, at least for females, Anglo-Americans were the most noncooperative, while Mexican-Americans and Negroes were the most cooperative. As mentioned in the introduction to this paper, the Anglo-American community is generally

more competitive than either the Mexican-American or Negro communities. It is not surprising, then, to see five- and six-year-old Anglo-American girls (who are supposedly more advanced in the socialization process, and therefore more mature and sensitive to the norms of the community from which they come, than are boys) engage in more competitive or noncooperative behavior than their Mexican-American and Negro peers.

The uniform lack of differences between immediate reward and delayed reward groups in the degree of cooperative behavior most likely resulted from the general novelty of the game for the children. It was assumed that this novelty acted to bring the motivational level up to an equal degree for both delayed and immediate reward groups. To add to the novelty effect, it was known immediately after the experimenters arrived in each school that there would be candy for all. Thus the element of uncertainty which "culturally deprived" children might customarily associate with delayed rewards was absent. The children not only had a constant motivational level, but they literally begged to be included in the experiment.

The lack of increase in cooperation as a function of trials was most likely the result of the small number

of trials being used, as compared with other studies using a game approach. For example, Vello (1967) used over 200 trials with an older group of subjects, and the first 30 trials were used just to establish the pre-game set. Even if it were practical to remove the children from their classrooms for the length of time needed to run 200 to 300 consecutive trials, the attention span, particularly of the culturally deprived, five- and six-year-old child would not allow this.

This last point offers an idea for further research with children in a game setting. In order to explore childrens' cooperative behavior in depth, it may be necessary to have several sessions with the same pair of children. If children were studied on a large number of repeated trials, the results could then be compared with those found with adults, in which case we might assume that any differences found between child and adult groups could be attributed to differences in maturation level, rather than dependent upon the differences in the physical setting of the experiments.

It would also seem valuable to replicate this experiment on four seven and eight year old children from "culturally deprived" backgrounds, such as are found in

many day care centers in Texas. If such a replication were made, it would be possible to see whether, as a function of the difference in age, four-year-old girls would respond in the same manner as five-and six-year-old boys, and older boys would respond similarly to the five and six year old girls. If such were the case, this difference could be traced to maturity and its relationship to the gradual adoption of community modes of response.

Practically, the results of this study suggest that at ages five and six, Anglo-American girls will be more responsive to ethnic-group differences in cooperation-competition game situations than will boys and will engage in less active cooperative activities with girls from dissimilar ethnic backgrounds than with girls from similar backgrounds. They will also generally be more competitive than Mexican-Americans and Negroes. This latter characteristic at least partially accounts for the greater school success of Anglo-American girls. Indeed, Moss and Kagan (1962) found that competitiveness correlated with progressing increases in I.Q. scores, especially for girls.

REFERENCES

Byrne, D. Interpersonal attraction as a function of affiliation need and attitude similarity. Human Relations, 1961, 14 (3), 283-289.

Byrne, D., and McGraw, C. Interpersonal attraction toward Negroes. Human Relations, 1964, 17, (3), 201-213.

Davis, A. American status systems and the socialization of the child. American Sociological Review, 1941, 6, 345-354.

Davis, A. Child training and social class. In R. G. Barker, J. A. Kounin and H. F. Wright (Eds.), Child Behavior and Development. New York: McGraw-Hill, 1943.

Dovan, E. Social status and success striving. Journal of Abnormal and Social Psychology, 1956, 52, 219-223.

Gallo, P. S., and McClintock, C. G. Cooperative and competitive behavior in mixed motive games. Journal of Conflict Resolution, 1965, 9 (1), 68-73.

Golightly, C., and Byrne, D. Attitude statements as positive and negative reinforcements. Science, 1964, 146, 798-799.

Gordon, E. W. Characteristics of socially disadvantaged children. Review of Educational Research, 1965, 35 (5), 377-388.

Guetzkow, H. Isolation and collaboration: a partial theory of international relations. Journal of Conflict Resolution, 1957, 1 (1), 48-68.

Hamman, S. B. UNESCO study. In G. E. Swansin, T. M. Newcomb and E. L. Hartley (Eds.), Readings in Social Psychology (Revised ed.). New York: Henry Holt, 1952, 288-299.

Leshan, L. L. Time orientation and social class. Journal of Abnormal and Social Psychology, 1952, 47, 589-592.

Madsen, W. Value conflicts in cultural transfer. In P. Worchel and Don Byrne (Eds.), Personality Change. New York: John Wiley & Sons, 1964, 470-489.

Maier, H. W. Three Theories of Child Development. New York: Harper & Row, 1965.

Moss, H. A., and Kagan, J. Maternal influences on early I.Q. scores. Psychological Reports, 1958, 4, 655-661.

Newcomb, T. M. Personality and Social Change. New York: Dryden Press, 1943.

Newcomb, T. M. The prediction of interpersonal attraction. American Psychologist, 1956, 11 (11), 575-586.

Rapaport, A. Critiques of game theory. Behavioral Science, 1959, 4 (1), 49-66.

Riessman, F. The culturally deprived child: a new view. Programs for the Educationally Disadvantaged. U.S. of Health, Education and Welfare, Office of Education Bulletin No. 1 , 1963. Govt. Printing Office, 1963, 3-10.

Smith, A. J. Similarity of values and its relation to acceptance and the projection of similarity. Journal of Psychology, 1957, 43, 251-260.

Terrell, G., Durkin, K., and Wiesley, M. Social class and the nature of the incentive in discrimination learning. Journal of Abnormal and Social Psychology, 1959, 59, 270-272.

Terrell, G., and Kennedy, W. A. Discrimination learning and transposition in children as a function of the nature of reward. Journal of Experimental Psychology, 1957, 53, 257-260.

Vello, S. The effect of an initial cooperative or competitive treatment upon a subject's response to conditional cooperation. Behavioral Science, 1967, 12 (4), 301-313.